

Flashback: Rapid scanning for radiological threats

November 1, 2015



[Decision Sciences' Multi-Mode Passive Detection System: Rapid scanning for radiological threats](#)

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Every Wednesday, *R&D Magazine* will feature a R&D 100 Flashback, chosen from our R&D 100 Awards archive of winners. This week's flashback is Los Alamos National Laboratory's Multi-Mode Passive Detection System (MM-PDS), which won the R&D 100 Award in 2013.

The Earth's upper atmosphere is under bombardment by cosmic radiation that produces showers of pions, which rapidly decay into a constant flux of muons (some $200 \text{ m}^2/\text{sec}$) that shower objects on Earth. Since the muon angular trajectory changes as a function of the density and atomic weight of the material traversed, a unique "signature" for the

substance can be developed. The ability to identify distinct material density enables the [Multi-Mode Passive Detection System \(MMPDS\)](#), developed by Decision Sciences International Corp. and Los Alamos National Laboratory, to quickly detect unshielded to heavily shielded nuclear threats, as well as gamma rays, with near-zero false alarms.

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